Health

Just as the goal of every safety-minded factory is zero accidents, the goal of every pesticide regulatory program is zero illnesses. At DPR, we recognize that accidents and mistakes will happen. But working toward zero illnesses means we ensure that potentially harmful materials have suitable controls, and we encourage everyone to use pesticides responsibly and only when needed.

ASSESSING THE HEALTH RISK OF PESTICIDES

The first step in making sure pesticides are used safely is to find out what the limits of safe use are. DPR scientists are among the world's best in evaluating the risk posed by pesticides and in developing ways to ensure those risks are minimized. In 2005 and 2006, DPR toxicologists completed 14 risk assessments and they are now working on 21 more.

Fumigant pesticides, used mainly to treat soil before planting, are more likely to drift and cause problems for workers and those living near application sites. It makes sense to study them as a group because measures to control these gaseous products are similar. To make most efficient use of our resources, we are working with the U.S. Environmental Protection Agency on risk assessments on these compounds, including methyl bromide, sulfuryl fluoride, 1,3-dichloropropene, dazomet, iodomethane, chloropicrin, and MITC.

STUDYING PESTICIDE EXPOSURE

You can't determine how to protect people from pesticides unless you know how much they are exposed to. Each year, scientists from DPR's Worker Health and Safety Branch collect data on pesticide exposure, to more accurately predict likely pesticide exposures and find out whether the measures we develop to reduce risk are effective. No other pesticide regulatory program in the U.S. does these studies.

In 2005 and 2006, DPR scientists studied worker exposure to pesticide products that produce phosphine, a toxic gas used to kill insects and rodents in stored grain and dried fruit. Another study focused on exposure to workers using conventional spray nozzles compared with workers using newer technology.

Our scientists also studied the exposure of workers who move irrigation equipment and who scout fields for pest problems, a study continuing into 2007. (Because of their short time in the field and limited exposure, these workers are exempt from many rules that restrict entry into fields after pesticide applications.)

PREVENTING ILLNESSES

Workers who apply pesticides or who enter treated fields face the greatest risk, and their protection has been a DPR priority for decades. Preventing pesticide illnesses takes a multipronged approach. We must have good information – based on the best science – on what harm a pesticide can do, in what situations. Then we must make sure people who use pesticides are properly trained and know what to do should accidents occur.

DPR's worker safety program has a history of firsts (and served as a model for federal worker standards), but we don't rest on our past accomplishments. For example, our technical experts have been evaluating several years of data on pesticide illnesses to find out whether current control measures for MITC, chloropicrin, and phosphine-generating products are effective.

Scientific staff also looked at illnesses after pesticides were applied to buildings such as offices or homes, to find out if there were common causes. Our analysis showed that training of workers who apply pesticides to buildings should be improved. We also found that existing rules could be better enforced, to make sure people are not present when pesticides are applied and that tenants and office workers are informed about pesticide applications.

Having a program in place to monitor pesticide exposures means that we can respond promptly to emergent problems and maintain a high level of safety.

MICHEL ORIEL

Michel Oriel

Worker Health and Safety Branch

DPR's program to collect and evaluate pesticide illness data is recognized as a model for the nation and as a world leader. In identifying causes of illness and exposure, evaluations by Michel and her colleagues help improve measures to protect people from harm that can be caused by pesticide exposure. Michel (who came to DPR seven years ago after working in private industry) also analyzes trends in pesticide illnesses. For example, for a recent project she evaluated 10 years of data on illnesses caused by the fumigant chloropicrin. For this, she examined the effects of factors such as weather, distance from treated fields, methods of application, and methods of fumigant containment.

Scientists are also studying illness information and other data to find out if product labeling and use controls are adequate to protect people who use handheld equipment to apply pesticides. (Handheld equipment, used in agricultural, industrial, residential and structural settings, includes backpack sprayers, hand wands, and spray bottles.)

Many pesticides require the use of personal protective equipment, like gloves, respirator, and special clothing. Each year, there are illnesses because workers do not wear this equipment or the equipment fails. We are also looking at our illness data over the past decade to see if we can find common causes that we can correct.

Because many workers are from Mexico and may cross the border to get medical treatment, we are working with Mexican health authorities to help set up a cross-border program for reporting pesticide-related illnesses.

IMPROVING PESTICIDE ILLNESS REPORTING

The law requires that any doctor who treats a patient with a possible pesticide illness must report that illness to the county health officer.

However, many doctors fail to follow through, either because they do not know of the reporting requirement or do not know the wide universe of chemicals that are considered pesticides. (Not only are insecticides, herbicides and fungicides pesticides, but also disinfectants, cleaners and sanitizers used widely in residential and institutional settings.)

DPR works continually to improve reporting of pesticide illnesses. With prompt notification of an illness, County Agricultural Commissioners can do better investigations. (Agricultural Commissioners investigate all pesticide illnesses reported in their counties.)

Through scientific analysis of the toxicology and exposure databases, we establish health standards designed to protect California workers and the public.

ANDY RUBIN

Andy Rubin

Medical Toxicology Branch

Andy is one of about 35 DPR toxicologists who conduct in depth evaluations of the pos sible health risks of pesticides. Over many months of intensive work, they review dozens or even hundreds of health based studies in order to produce detailed 300 page risk charac terization documents that ask (and answer) questions like, "Under current use conditions in California, at what level of human exposure to a given pesticide can we reasonably ensure the absence of adverse health effects? What exposure routes (oral, dermal, inhalation, etc.) and exposure times (acute, subchronic, chronic, lifetime) are the most toxicologically relevant to California use patterns?" The work DPR scientists do helps make California safer for workers and the public.

In a pilot project in the late 1990s, DPR contracted with the California Poison Control Center system to file reports for doctors. The project was a success and we learned of many illnesses that would have otherwise gone unreported (especially those caused by nonoccupational use of home-use pesticides). The State's fiscal crisis in 2001 meant the end of that pilot project. However, stable funding in 2006 prompted DPR to renew its arrangement with the Poison Control Centers. Under a three-year contract, the centers can electronically report pesticide illnesses they receive to county health officers and County Agricultural Commissioners.

BETTER RESPONSE TO ODOR COMPLAINTS

Illnesses related to odor and illnesses that affect communities near farms received special attention in 2005 with an update of the handbook Agricultural Commissioners use to investigate pesticide-related illnesses. The new manual provides guidance in developing plans for doing illness investigations and in writing clear and complete accounts to record investigation results. It also incorporates a protocol for investigating episodes in which pesticides affect large numbers of people living near a pesticide application.

Another improvement is documentation of DPR's policy on complaints or illnesses related to odor. The policy recognizes that if a person smells a pesticide, it is an indicator of exposure. Exposure to pesticides does not necessarily mean the application was done wrong and the pesticide was applied incorrectly. That must be determined by the investigation. If a violation is found, it can result in enforcement action against the applicator, including fines and other penalties. If the application was done according to the label and caused odor problems, DPR can explore the need for added controls to eliminate odor problems.

WORKING WITH WORKERS ON PESTICIDE SAFETY

Our Worker Health and Safety Branch technical experts are improving leaflets designed to help employees work safely with pesticides. They are developing a new handout that will give workers more detailed and useful information on how they might be exposed to pesti-

cides, and how to recognize symptoms of pesticide-related illnesses. Recent worker surveys and input from worker focus groups guided the changes. This leaflet will become an integral part of the pesticide safety training field-workers go through regularly.

In 2007, DPR plans to propose new rules to so employees can get more information about pesticides being used in the fields in which they work. The regulations will provide agricultural workers with protection that goes beyond state or federal guidelines. The rules culminate several years of investigation and analysis by DPR's health and safety experts, who also consulted with industry and worker advocates. The rules to be proposed will:

- Require pesticide applicators to notify the grower before and after a chemical is used, and re-notify if the scheduled application date changes.
- Require the grower to manage his property as if the application could occur anytime within a 24-hour time window.
- Require hired contractors and growers to assure prior notification for any employees who walk within one-quarter mile of a treated field.

Shift toward lower-risk pesticides

Under California law, all agricultural pesticide use must be reported to the State, along with commercial applications by pest control businesses to homes and other structures. DPR statistics for 2005 show 195 million pounds reported applied, compared to 180 million pounds the year before. There was less use of many of the more toxic compounds, and more pounds of reduced-risk pesticides used. Half the overall increase in pesticide use was in sulfur, a natural compound both organic and conventional growers apply to combat powdery mildew, a plant disease.

OTHER KEY CHANGES FROM 2004 TO 2005

- Pounds of reduced-risk pesticides increased by 650,000 pounds applied (61 percent) and by 2.5 million acres treated (40 percent).
- Pounds of all the higher risk pesticide categories decreased, except for toxic air contaminants.
- Acres treated with carcinogens and organophosphates increased, mostly because of increased use of the fungicides mancozeb and maneb and the insecticide chlorpyrifos.
- Pounds of chemicals categorized as toxic air contaminants remained nearly the same as in 2005, while cumulative acres treated increased by 7 percent.
- Fumigant chemicals decreased in pounds applied (2 percent) and in cumulative acres treated (14 percent). Fumigants are gaseous pesticides used in agriculture mainly to treat soil before planting.
- Chemicals classified as reproductive toxins decreased in pounds applied (9 percent) and in cumulative acres treated (3.6 percent). Pounds of insecticide organophosphate and carbamate chemicals, which include compounds of high regulatory concern, continued to decline as they have for nearly every year since 1995.